

WHAT IS CLAIMED IS:

1. An automated process for monitoring water quality comprising:
 - rinsing and gas purging a system for monitoring water quality;
 - performing self-test and calibrating probes;
 - recording calibration data;
 - rinsing and gas purging the system;
 - optionally notifying an operator if the operational parameters of the probes do not meet prespecified criteria;
 - introducing sample to be tested into the system;
 - optionally adding buffer or ionic-strength adjusting solution;
 - measuring the analytes to be determined in the sample as a measure of water quality;
 - recording the measurements;
 - optionally adding appropriate solution for a dilution or a spike, measuring the analytes to be determined in the sample, and recording the water-quality measurement;
 - optionally recalibrating the system after a number of samples are measured to detect drift of probe calibration parameters; and
 - producing or transmitting a computer file to record the results of the sampling.

2. The process according to claim 1 wherein once

the water quality conditions are monitored, further notifying an operator of the results obtained for the water quality conditions monitored.

3. The process according to claim 2 wherein the operator is notified using a voice modem or electronic mail.

4. The process according to claim 1 wherein the status of the system is monitored based upon signals indicating the existence of at least one error condition.

5. The process according to claim 4 wherein the error conditions are selected from the group consisting of low sample level, insufficient power supply, malfunctioning probes, and at least one measurement lying outside a predetermined range.

6. The process according to claim 4 wherein, once an error condition is detected, the process is terminated and a warning signal is automatically transmitted to an operator.

7. An automated self-calibrating water quality monitoring system housing assembly comprising:

a plurality of ion-selective electrodes and probes combined in a single flow train for multi-constituent analysis of a plurality of samples;

inlet ports for introducing purified fluids to gas purge the system and to clean the system between samples;

reservoirs for solutions, used in water quality monitoring;

a pump for introducing said solutions from the

reservoirs through ports to sample containers;
sample containers connected to a sample pump to be sent through the flow train for analysis;
a recirculation pump for optionally recirculating samples and reagents ; and
an electronic control module for controlling the system and collecting data obtained from the electrodes and the probes.

8. The system according to claim 7 further including a heat pump for temperature control.

9. The system according to claim 7 wherein the probes are selected from the group consisting of temperature, conductance, dissolved oxygen content, turbidity, and pH.

10. The system according to claim 7 wherein the ion-selective electrodes are selective for ions selected from the group consisting of ammonium, chloride, sodium, calcium, lead, cadmium, copper, nitrate, and nitrite.

11. The system according to claim 7 wherein the flow train is configured for repeated measurement in a recirculation loop.

12. The system according to claim 7 wherein the solutions are selected from the group consisting of deionized water, ionic strength adjustment solutions, and known volumes of standard solutions.